

Appl. No. 10/086,272
Amendment & Response After Final Rejection

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Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Claims 1 - 71 (cancelled).

Claim 72 (previously presented): A system for projecting an image onto a viewing surface, comprising:

at least three light beams,

a scanner adapted to direct at least three of the light beams onto the viewing surface to form a two-dimensional pattern of at least three spots on the viewing surface,

said scanner being further adapted to traverse the directed light beams during each of a succession of scan passes during a frame pass, wherein at substantially the same time during at least one scan pass of such frame pass, at least one spot of the pattern of spots substantially illuminates a dot location of such array that is not adjacent to the dot location illuminated by any other spot of the pattern of spots and at least three of the spots are substantially aligned in a straight line angled with respect to the lines of dot locations.

Claim 73 (cancelled).

Claim 74 (originally presented): The system of claim 72 wherein during a frame pass at least one spot scanned to illuminate at least one line of dot locations during one scan pass of such frame pass is not scanned to illuminate any line of dot locations adjacent to such one line of dot locations during any other scan pass of such frame pass.

Claim 75 (originally presented): The system of claim 72 wherein said scanner is a raster scanner.

Claim 76 (cancelled).

Claim 77 (originally presented): The system of claim 72 wherein at some time during a scan pass at least one line is incomplete while another line is complete.

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Claims 78-79 (cancelled).

Claim 80 (previously presented): The system of claim 72 or 75, wherein movement of the pattern of spots in the frame direction is substantially continuous during such frame pass.

Claims 81-82 (cancelled).

Claim 83 (previously presented): The system of claim 72 or 74, wherein each spot of the pattern of spots is so aligned and substantially illuminates locations along a different line of dot locations on the viewing surface during at least one of the scan passes.

Claim 84 (cancelled).

Claim 85 (previously presented): The system of claim 72, wherein at least four of the light beams are directed to the viewing surface by said scanner such that at least four of said spots are aligned at an angle with respect to the lines of dot locations.

Claim 86 (currently amended): The system of claim 72, wherein at least twelve of the light beams are directed to the viewing surface by said scanner such that [the] at least twelve of said spots are aligned at an angle with respect to the lines of dot locations.

Claim 87 (cancelled).

Claim 88 (previously presented): The system of claim 72, wherein all of the spots of the pattern of spots are so aligned.

Claim 89 (cancelled).

Claim 90 (previously presented): A method for projecting an image onto a viewing surface, comprising the steps of:

illuminating the viewing surface at substantially the same time with at least three spots of a two-dimensional pattern of spots;

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sweeping such pattern of spots during a scan pass substantially along at least two different lines of desired dot locations of a two-dimensional array of desired potential dot locations to be illuminated on the viewing surface during a frame pass;

adjusting the position of the pattern of spots on the viewing surface in a frame direction transverse of the lines of dot locations; and

repeating the sweeping and adjusting steps a desired number of times to write a frame, wherein during each of one or more sweeping steps at least one spot of the pattern of spots substantially illuminates a dot location of such array that is not adjacent to the dot location illuminated by any other spot of the pattern of spots, and at least three spots of the pattern of spots are substantially aligned in a straight line angled with respect to the lines of dot locations.

Claim 91 (cancelled).

Claim 92 (previously presented): The method of claim 90 wherein all spots of the pattern of spots are substantially aligned in a straight line angled with respect to the lines of dot locations.

Claim 93-94 (cancelled).

Claim 95 (currently amended): The method of claim 90 [, 91] or 92, wherein at least one spot of the pattern of spots illuminating dot locations in a given line of dot locations during a sweeping step does not illuminate another line of dot locations adjacent to such given line of dot locations during any other sweeping step during the same frame pass.

Claim 96 (currently amended): The method of claim 90 [, 91] or 92, wherein said adjusting step is substantially continuous during the frame pass.

Claim 97 (originally presented): The method of claim 90 wherein at some time during a scan pass all dot locations in at least one line of dot locations have not been illuminated by at least one spot while all dot locations in another line of dot locations have been illuminated by at least one other spot.

Claims 98-153 (cancelled).

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Claim 154 (previously presented): A system for projecting a frame of an image onto a viewing surface, comprising:

two or more light beams,

a scanner adapted to direct the light beams to form two or more spots on the viewing surface and to traverse the directed light beams such that the spots are swept along different sweep paths on the viewing surface during each of a succession of scan passes written during a frame pass and the spots are adjusted transverse of the sweep paths during such frame pass, and

said light beams and said scanner are configured such that all of said spots are substantially aligned along a slant line substantially non-perpendicular to the sweep paths and each of such spots is swept along a different sweep path during at least one scan pass of such succession of scan passes.

Claim 155 (previously presented): The system as in claim 154, further comprising:

three or more light beams,

said scanner being further adapted to direct the light beams to form three or more substantially aligned spots on the viewing surface.

Claim 156 (previously presented): The system as in claim 154, further comprising:

twelve light beams,

said scanner being further adapted to direct the light beams to form twelve substantially aligned spots on the viewing surface.

Claim 157 (previously presented): The system as in claim 154, 155 or 156, wherein said scanner is further adapted to sweep said spots along sweep paths substantially corresponding to lines of dot locations of an array of dot locations of the frame to be illuminated on the viewing surface, and wherein during each of a preponderance of such scan passes during such frame pass at least two of such substantially aligned spots illuminate adjacent lines of dot locations.

Claim 158 (previously presented): The system as in Claim 157 and further comprising

at least one optical fiber adapted to emit at least one of the light beams directed to the viewing surface from an emitting end thereof.

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Claim 159 (previously presented): The system as in claim 154, 155 or 156, further comprising an adjustable structure adapted to change the angle of the slant line with respect to the sweep paths.

Claim 160 (previously presented): The system as in claim 159, further comprising
at least two optical fibers having emitting ends arranged in a head, said beams being emitted from such emitting ends; and
said adjustable structure being adapted to move said head to change the orientation of the beams with respect to the scanner to change the angle of the slant line with respect to the sweep paths.

Claim 161 (previously presented): The system as in claim 154, 155 or 156, wherein a preponderance of said light beams are of wavelengths in the visible light spectrum.

Claim 162 (previously presented): The system as in claim 154, 155 or 156, wherein at least one of said light beams is generated by lasers.

Claim 163 (previously presented): The system as in claim 162, further comprising at least one of such spots being a combined spot formed by a combined beam of at least two substantially different wavelengths.

Claim 164 (previously presented): The system as in claim 163, further comprising at least one of such spots being a composite spot formed by a composite beam.

Claim 165 (previously presented): A method for projecting an image onto a viewing surface during a given frame pass, comprising the steps of:

illuminating the viewing surface with two or more spots, all of such spots being substantially aligned along a slant line;
sweeping the spots to substantially illuminate different sweep paths on the viewing surface, the slant line being substantially non-perpendicular to the sweep paths;
repeating the sweeping step a desired number of times; and
adjusting the position of the spots transversely of the sweep paths.

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Claim 166 (previously presented): The method as in claim 165, wherein
the illuminating step further comprises illuminating three or more of such aligned spots on the
viewing surface; and
the sweeping step further comprising sweeping the spots to substantially illuminate three or more
different sweep paths on the viewing surface.

Claim 167 (previously presented): The method as in claim 165 or 166, further comprising the step
of:
changing the angle of the slant line with respect to the sweep paths.

Claim 168 (previously presented): The method as in claim 165 or 166, wherein a preponderance
of the spots are of wavelengths in the visible light spectrum.

Claim 169 (previously presented): The method as in claim 165 or 166, wherein during said
sweeping steps the spots are swept substantially along lines of dot locations of an array of dot locations of
the frame to be illuminated on the viewing surface, and at least two of the lines of dot locations swept by
the substantially aligned spots are adjacent.

Claim 170 (previously presented): The method as in claim 169, further comprising the steps of:
emitting light beams from emitting ends of optical fibers to form such spots on the viewing
surface.

Claim 171 (previously presented): The method as in claim 165 or 166, further comprising the
steps of:
emitting light beams from emitting ends of optical fibers to form such spots on the viewing
surface.

Claim 172 (previously presented): The method as in claim 171, further comprising the step of:
changing the angle of the slant line with respect to the sweep paths.

Claim 173 (previously presented): The method as in claim 171, wherein at least one of said light
beams is generated by lasers.

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Claim 174 (previously presented): The method as in claim 171, further comprising the steps of:
combining two or more light beams into at least one optical fiber using at least one fiber-based
beam coupler.

Claim 175 (currently amended): The [system] method as in claim 174 and adapted such that the
resulting combined beam is a composite beam.

Claim 176 (previously presented): The method as in claim 174, further comprising the steps of:
combining one or more of such combined light beams with at least one other light beam into at
least one optical fiber using at least one fiber-based beam coupler.

Claim 177 (previously presented): The method as in claim 176, wherein said illuminating step
further comprises illuminating the viewing surface with one or more composite spots including at least two
substantially different wavelengths.

Claim 178 (previously presented): A system for projecting a frame of an image onto a viewing
surface, comprising:

three light beams,

a scanner adapted to direct the light beams to form three spots on the viewing surface and to
traverse the directed light beams such that the spots are swept along sweep paths on the viewing surface
during each of a succession of scan passes written during a frame pass and the spots are adjusted
transverse of the sweep paths during such frame pass, and

said light beams and said scanner are configured such that two or more of said spots are
substantially aligned along a slant line substantially non-perpendicular to the sweep paths and each of such
aligned spots is swept along a different sweep path during at least one scan pass of such succession of scan
passes.

Claim 179 (previously presented): A system for projecting a frame of an image onto a viewing
surface, comprising:

four or more light beams,

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a scanner adapted to direct the light beams to form four or more spots on the viewing surface and to traverse the directed light beams such that the spots are swept along at least three sweep paths on the viewing surface during each of a succession of scan passes written during a frame pass and the spots are adjusted transverse of the sweep paths during such frame pass, and

said light beams and said scanner are configured such that a majority of said spots are substantially aligned along a slant line substantially non-perpendicular to the sweep paths and each of such aligned spots is swept along a different sweep path during at least one scan pass of such succession of scan passes.

Claim 180 (previously presented): The system as in claim 179, further comprising:
twelve light beams,
said scanner being further adapted to direct the light beams to form twelve substantially aligned spots on the viewing surface and sweep such spots along different sweep paths.

Claim 181 (previously presented): The system as in claim 179, wherein during each of a preponderance of such scan passes during such frame pass at least two of such substantially aligned spots that are adjacent along the slant line substantially illuminate non-adjacent lines of dot locations.

Claim 182 (previously presented): The system as in claim 178, 179 or 180, wherein said scanner is further adapted such that the sweep paths substantially correspond to lines of dot locations of an array of dot locations of the frame to be illuminated on the viewing surface, and wherein during each of a preponderance of such scan passes during such frame pass at least two of such substantially aligned spots illuminate adjacent lines of dot locations.

Claim 183 (previously presented): The system as in claim 154, 155, 156, 178, 179 or 180, wherein said scanner is further adapted such that the sweep paths substantially correspond to lines of dot locations of an array of dot locations of the frame to be illuminated on the viewing surface, and wherein during each of a preponderance of such scan passes during such frame pass at least two of the sweep paths substantially correspond to different lines of dot locations.

Claim 184 (previously presented): The system as in claim 154, 155, 156, 178, 179 or 180, wherein said scanner is further adapted such that the sweep paths substantially correspond to lines of dot locations of an array of dot locations of the frame to be illuminated on the viewing surface, and wherein during each

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of a preponderance of such scan passes during such frame pass at least two of the sweep paths substantially correspond to the same line of dot locations.

Claim 185 (previously presented): The system as in claim 155, 156, 179 or 180, wherein the substantially aligned spots are substantially evenly spaced along the slant line.

Claim 186 (previously presented): The system as in claim 155, 156, 179 or 180, wherein the substantially aligned spots are substantially unevenly spaced along the slant line.

Claim 187 (previously presented): The system as in claim 179 or 180, wherein a preponderance of said light beams are of wavelengths in the visible light spectrum.

Claim 188 (previously presented): The system as in claim 179 or 180, further comprising at least one of such spots being a composite spot formed by a composite beam of at least two substantially different wavelengths.

Claim 189 (previously presented): The system as in claim 154, 155, 156, 178, 179 or 180, further comprising at least one dot location being substantially overwritten during different scan passes by at least two beams having substantially different wavelengths to form a composite color substantially at such overwritten dot location.

Claim 190 (previously presented): The system as in claim 154, 155, 156, 178, 179 or 180, wherein said scanner is further adapted such that the sweep paths substantially correspond to lines of dot locations of an array of dot locations of the frame to be illuminated on the viewing surface, and wherein during each of a preponderance of such scan passes during such frame pass all lines of dot locations illuminated by such substantially aligned spots are adjacent.

Claim 191 (previously presented): The system as in claim 190, wherein said light beams and said scanner are further adapted such that during a preponderance of such scan passes during such frame pass at least two of such substantially aligned spots illuminating adjacent lines of dot locations are adjacent along the slant line.

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Claim 192 (previously presented): The system as in claim 190, wherein said light beams and said scanner are further adapted such that during a preponderance of such scan passes during such frame pass at least two of such substantially aligned spots illuminating adjacent lines of dot locations are not adjacent along the slant line.

Claim 193 (previously presented): The system as in claim 190, wherein said light beams and said scanner are further adapted such that during a preponderance of such scan passes during such frame pass all of such substantially aligned spots illuminating adjacent lines of dot locations are adjacent along the slant line.

Claim 194 (previously presented): The system as in claim 179, and further comprising at least one optical fiber adapted to emit at least one of the light beams directed to the viewing surface from an emitting end thereof.

Claim 195 (previously presented): The system as in claim 179, 180 or 194, further comprising an adjustable structure adapted to change the angle of the slant line with respect to the sweep paths.

Claim 196 (previously presented): The system as in claim 195, wherein such light beams and scanner are further adapted such that when the angle of the slant line with respect to the sweep paths is changed by said adjustable structure, the spacing between sweep paths is also adjusted.

Claim 197 (previously presented): The system as in claim 179, 180 or 194, wherein at least one of said light beams is generated by lasers.

Claim 198 (previously presented): The system as in claim 158, 160 or 194, and adapted such that two or more of such light beams within one or more optical fibers are combined into one or more optical fibers using one or more fiber-based beam couplers.

Claim 199 (previously presented): The system as in claim 198, and adapted such that the resulting combined beam forms a combined spot.

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Claim 200 (previously presented): The system as in claim 198 and adapted such that one or more combined light beams within one or more optical fibers are combined with one or more other light beams within one or more other optical fibers into one or more optical fibers using one or more fiber-based beam couplers.

Claim 201 (previously presented): The system as in claim 200, and adapted such that the resulting combined beam is a composite beam.

Claim 202 (previously presented): The system as in claim 201, and adapted such that the composite beam forms a composite spot.

Claim 203 (previously presented): A system for projecting a frame of an image onto a viewing surface, comprising:

four or more light beams,

a scanner adapted to direct the light beams to form four or more spots on the viewing surface and to traverse the directed light beams such that the spots are swept along at least three sweep paths on the viewing surface during each of a succession of scan passes written during a frame pass and the spots are adjusted transverse of the sweep paths during such frame pass, and

said light beams and said scanner are configured such that said spots are substantially aligned along two or more slant lines, each slant line being substantially non-perpendicular to the sweep paths.

Claim 204 (previously presented): The system as in claims 154, 155, 156, 178, 179, 180 or 203, wherein said scanner is a raster scanner.

Claim 205 (previously presented): The system as in claims 154, 155, 156, 178, 179, 180 or 203, wherein said scanner is a continuous raster scanner.

Claim 206 (previously presented): The system as in claims 154, 155, 156, 178, 179, 180 or 203, wherein said image being projected on the viewing surface is a high definition image.

Claim 207 (previously presented): A method for projecting an image onto a viewing surface during a given frame pass, comprising the steps of:

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illuminating the viewing surface with three spots, at least two of such spots substantially aligned along a slant line;

sweeping each of the aligned spots to substantially illuminate a different sweep path on the viewing surface, the slant line being substantially non-perpendicular to the sweep paths;

repeating the sweeping step a desired number of times; and

adjusting the position of the spots transversely of the sweep paths.

Claim 208 (previously presented): A method for projecting an image onto a viewing surface during a given frame pass, comprising the steps of:

illuminating the viewing surface with four or more spots, a preponderance of such spots substantially aligned along a slant line;

sweeping each of the aligned spots to substantially illuminate a different sweep path on the viewing surface, the slant line being substantially non-perpendicular to the sweep paths;

repeating the sweeping step a desired number of times; and

adjusting the position of the spots transversely of the sweep paths.

Claim 209 (previously presented): The method as in claim 207 or 208, wherein during said sweeping steps the aligned spots are swept substantially along lines of dot locations of an array of dot locations of the frame to be illuminated on the viewing surface, and at least two of the lines of dot locations swept by the substantially aligned spots are adjacent.

Claim 210 (previously presented): The method as in claim 207 or 208, wherein during said sweeping steps at least two of the aligned spots are swept substantially along different lines of dot locations of an array of dot locations of the frame to be illuminated on the viewing surface.

Claim 211 (previously presented): The method as in claim 207 or 208, wherein during said sweeping steps at least two of the aligned spots are swept substantially along the same line of dot locations of an array of dot locations of the frame to be illuminated on the viewing surface.

Claim 212 (previously presented): The method as in claim 208, wherein a preponderance of the spots are of wavelengths in the visible light spectrum.

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Claim 213 (previously presented): The method as in claim 208, wherein said illuminating further comprises illuminating the viewing surface with one or more combined spots including at least two substantially different wavelengths.

Claim 214 (previously presented): The method as in claim 208, wherein during said sweeping steps the aligned spots are swept substantially along lines of dot locations of an array of dot locations of the frame to be illuminated on the viewing surface, and at least two of the lines of dot locations swept by adjacent spots of the substantially aligned spots are not adjacent.

Claim 215 (previously presented): The method as in claim 165, 166 or 208, further comprising the step of:

overwriting substantially the same dot locations during different sweeping steps with at least two different spots including substantially different wavelengths to form a composite color substantially at such overwritten dot locations.

Claim 216 (previously presented): The method as in claim 165, 166, 207 or 208, wherein during said sweeping steps the aligned spots are swept substantially along lines of dot locations of an array of dot locations of the frame to be illuminated on the viewing surface, and all lines of dot locations swept by the substantially aligned spots are adjacent.

Claim 217 (previously presented): The method as in claim 165, 166 or 208, further comprising the steps of:

emitting light beams from emitting ends of optical fibers mounted in a head,
orienting the head with respect to the scanner such that during the illuminating step the light beams form the spots on the viewing surface; and
moving the head to change the orientation of the beams to the scanner thereby changing the angle of the slant line with respect to the sweep paths.

Claim 218 (previously presented): The method as in claim 208, further comprising the steps of:
emitting light beams from emitting ends of optical fibers to form at least one of such spots on the viewing surface.

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Claim 219 (previously presented): The method as in claim 208 or 218, further comprising the step of:

changing the angle of the slant line with respect to the sweep paths.

Claim 220 (previously presented): The method as in claim 208 or 218, further comprising the steps of:

changing the angle of the slant line with respect to the sweep paths thereby
adjusting the spacing between the sweep paths.

Claim 221 (previously presented): The method as in claim 208 or 218, wherein at least one of said light beams is generated by lasers.

Claim 222 (previously presented): The method as in claim 218, further comprising the steps of:
combining two or more light beams into at least one optical fiber using at least one fiber-based beam coupler.

Claim 223 (previously presented): The method as in claim 222, further comprising the steps of:
combining one or more of such combined light beams with at least one other light beam into at least one optical fiber using at least one fiber-based beam coupler.

Claim 224 (currently amended): The [system] method as in claim 223 [and adapted such that] wherein the resulting combined beam is a composite beam.

Claim 225 (previously presented): A method for projecting an image onto a viewing surface during a given frame pass, comprising the steps of:

illuminating the viewing surface with four or more spots substantially aligned along two or more slant lines;

sweeping each of the aligned spots to substantially illuminate at least three different sweep paths on the viewing surface, each slant line being substantially non-perpendicular to the sweep paths;

repeating the sweeping step a desired number of times; and

adjusting the position of the spots transversely of the sweep paths.

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Claim 226 (previously presented): The system as in claims 165, 166, 207, 208 or 225, wherein said scanner is a raster scanner.

Claim 227 (previously presented): The system as in claims 165, 166, 207, 208 or 225, wherein said scanner is a continuous raster scanner.

Claim 228 (previously presented): The system as in claims 165, 166, 207, 208 or 225, wherein said image being projected on the viewing surface is a high definition image.